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Shopping experience for all. Social inclusion through the multisensorial design of daily activities

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Abstract

The possibility to perform independently and comfortably all daily activities, including those related to recreation and free time such as shopping, is a critical precondition for pursuing inclusion. In this it is necessary to pay special attention to the needs of the so-called “limit users", i.e. that particular group of individuals who have the skills as the most "critical" to carry out an activity, and therefore experience it, in an autonomous way. In Design for All (DfA), an important phase of the design process includes the identification of the limit users. This work presents the results of an experience carried out as part of a graduation thesis breakthrough in the Department of Architecture of Pescara, whose intent was to facilitate the choice of an item of clothing during the shopping experience, starting from the needs of those who have the greatest difficulties, namely individuals with visual disabilities. Based on the approach of Design for All and on some concepts from the studies on synesthesia, and in relation to the complexity of the considered scenario (shopping experience) and to the needs expressed mainly by the visually impaired, the research project has developed a system of information/display elements, which enable "all" to the autonomous and conscious choice of an item of clothing. In particular, starting from the use of a specific analysis tool developed previously, it was possible to define a system of design guidelines to facilitate the free choice of the item of clothing by people with visual impairments. The contribution concludes with the presentation of a product concept, developed on the basis of the guidelines, referring to an integrated “clothes hanger - stand - label", characterized by specific morphological, sensorial, and technological features.

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Keywords: Design for all; inclusion; limit users; synesthesia; abilities and difficulties; shopping experience.

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1. Introduction

"Design for All (DfA) is design for human diversity, social inclusion and equality." This definition, recovered from EIDD Stockholm Declaration (European Institute for Design and Disability), is the founding principle for the design of environments, equipment and services, accessible, autonomously, from people with different needs and abilities. It is a concept and at the same time a design approach of European expressly matrix, which is connected to the most well-known North American Universal Design, from which, however it differs in a substantial way because it is based on a participatory process to the project by all "stakeholders" involved. The target of DfA, in fact, substantially extends to all humanity, with all its diversity, not only mental and physical, but also cultural or social, temporary or permanent.

In the DfA approach, therefore, human diversity is a "resource" to be enhanced rather than a "constraint" to be considered in the design stage. In this perspective, the concept of "user" extends from the "final" or primary to "all" the actors of the whole supply chain of the life cycle of the product. The goal is achieve the satisfaction of needs, desires and aspirations of all individuals who, for various reasons, wish and have a reasonable likelihood of benefit, or better, "experiencing" the product autonomously.

This enlargement of the horizon, however, can become a problem for the designer, who still has the need and obligation to know the characteristics and needs of the user-target of his project. In fact, to complete the project brief, it is important to know what will be the "beneficiaries" of the project, analyzing the characteristics and needs. Only in this way the designer is then able to define a framework of project requirements and therefore the possible levels of action for pursuing solutions that do not marginalize or discriminate individuals. But this, as you can imagine, it is quite a difficult task, if the target is extended to many "categories" of possible users.

Add to this, also, that the designers are often have difficulty at controlling objectively those aspects of the project related to other senses than view, which instead is useful to consider for inclusive projects. The historical dominance of the view over other senses, in fact, did not allow the harmonious and aware development of languages and design tools that are equally effective, and able to control odors, noises and tactile qualities of products. The result is that, if western culture has built a mature critical awareness concerning the "visual" artifacts, not nearly is the case for other aspects of perceptual experience of products. In a logic of inclusion, however, the designer needs to enhance human diversity and with it all the residual abilities of the target audience, ie those that overcome any deficiencies related to "sensory channels" that have more difficulties.

The possibility to perform certain activities autonomously and comfortably is essential for pursuing inclusion. This compared to all daily activities, including those related to recreation. Some of them are particularly difficult for individuals who have particular difficulties or disabilities. Among them, for example, the ability to purchase autonomously items of clothing, especially for the blind.

2. Objectives

This contribution presents the results of an experience carried out as part of a graduation thesis breakthrough in the Department of Architecture of Pescara, whose intent was to make it easier "for all" the choice of an item of clothing, during the “shopping experience”. This was done starting from the needs of those who have the greatest difficulties with respect to this task, namely individuals with visual impairments.

In particular, starting from some studies on synesthesia and using the A/D Table (a useful tool useful to identify the limit target with respect to specific tasks, previously developed at the same Department of Architecture of Pescara), the research has had the objective of defining a group of design requirements for an information/exhibition system that was able to facilitate the autonomously purchase of clothes from everyone, starting with the needs of people with visual impairments. In this, referring to concepts such as enjoyment, wellbeing, emotion and pleasant shopping experience.

3. Method

The problem of recognition of products, especially in unfamiliar environments, is strongly felt especially by the visually impaired, who, without the help of carers, generally do not have access to some basic information of places and products. For the shopping experience, for example, in the absence of specific aids, it is easy to imagine the difficulties of a blind with respect to the orientation within the store, to the identification of the display which contains the searched clothes, to selection of the best clothes to buy. Leaving aside the first two aspects that are related to the more general spatial orientation issue, which has already been debated by a wide literature and numerous application examples (eg, in the accessible museum routes), the research has focused directly on the independent choice of the item of clothing, that is the ability to acquire information about the color, its shade, the possible combinations with other clothes, the size or simply the sale price. Obviously, with respect to such activities, blind people are the limit target, that is the user group with the greatest difficulties. The commitment so was to find solutions that, starting from the difficulties of blind people, could also be useful to all other potential users.

For this purpose, the research was divided into four phases.

3.1. Recognition of the solutions and technologies for the "visually impaired" and of information and exhibition systems in the clothing sector

The research initially conducted a survey on the main design solutions, Assistive products, systems and assistive technologies that currently allow the blind to explore and learn about the environments in which they live. In particular, the research was conducted with respect to applied research, systems and products, spatial solutions.

Among these, were analyzed of reading, writing and recognition of colors systems, based on voice synthesis, sound signals and specific codes of writing; products and systems to facilitate the understanding of displays in the specific areas of clothing and accessories, such as tactile labels for the blind, interactive web sites, systems that are based on synesthetic experiences, namely involving the simultaneous presence of multiple sensory stimulation.

In parallel it was carried out a search of the most popular and innovative systems for tissue classification, labeling and display of clothes. A deepening has been dedicated also to the types of clothes hangers and stands for clothes hangers.

3.2. Individuation of critical users

The experience of buying an item of clothing can be broken down into four different macro activities: the identification of the department of interest inside the store, the choice of the dress, the fitting of it and the payment of the purchased clothes. Each of these activities has been broken down into a variable set of simpler tasks, according to the methodology of HTA (Hierarchical Task Analysis).

At this point the research has used the A/D Table tool [1,2]: the Ability/Difficulty Table is an investigative tool of the limit target useful for the DfA approach that, from the decomposition of a activities through the HTA, allows you to identify for each task to be carried out which are the needed skills and which the disabilities more penalized.

In particular, the previous four macro-activity have been analyzed, and then, subsequently, the research focused on those considered most critical for multi-user, namely the selection and fitting of clothes.

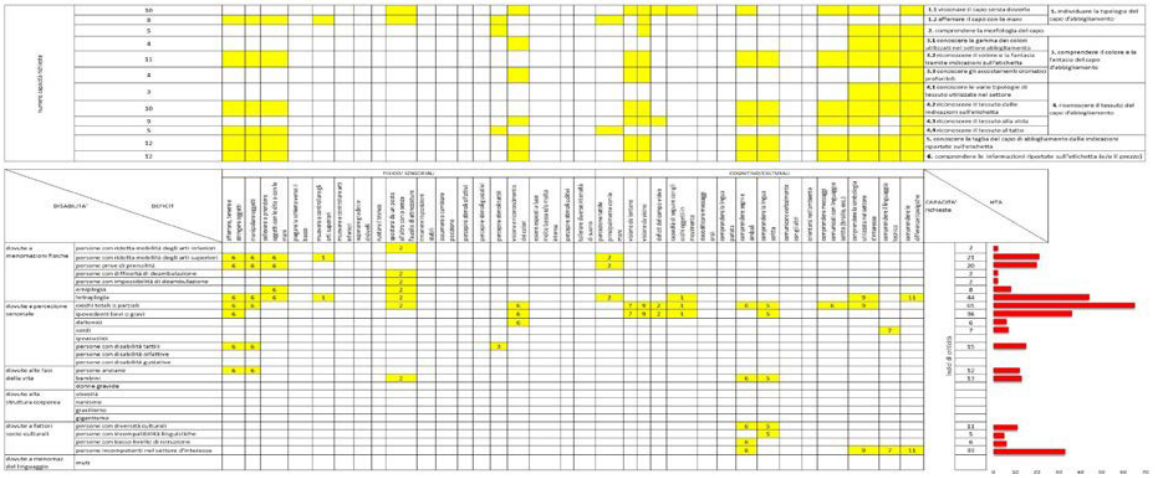

Fig. 1. The A/D Table applied in the evaluation of the activity "choice of the dress"

3.3. The requirements of the information/exhibition system for autonomous choice of dresses

The A / D Table was used to develop a sufficiently exhaustive panel of the requirements relating to an information and exhibition system useful for autonomous choice of clothes from everyone. This starting from the difficulties and residual abilities of the visually impaired, which clearly are the target more critical respects to the shopping experience.

In particular, the identified system was composed of:

- clothes hanger
- dress label
- stand for clothes hangers

Each of these elements has been associated with a framework of requirements which takes into account of the interaction among the three elements, the clothes and, of course, the multi-user.

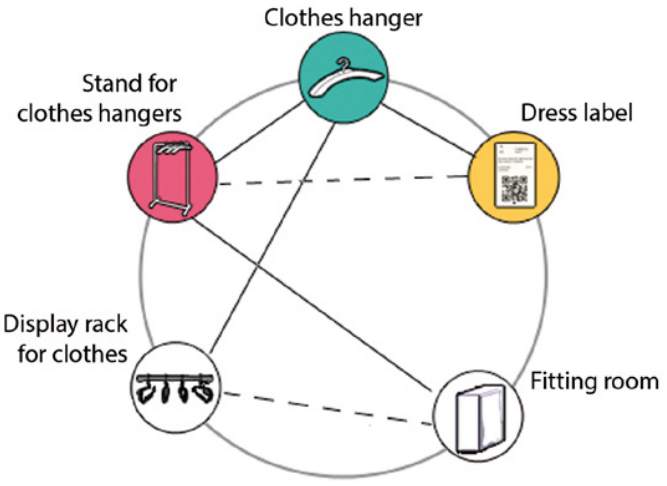

Fig. 2. The whole system of the "clothing shopping experience" tools

3.4. The choice of the materials for the components of the system

A specific investigation was reserved to the identification of the most suitable material for the production of the elements of the system, and in particular of the clothes hanger and of the stand for clothes hangers. The choice fell on:

- Wood liquid (Arboform), thermoplastic composite biopolymer, 100% recyclable, which can be printed as a common thermoplastic, with all the versatility and ease of the process of doing so (therefore also injection molding gas assisted);
- PLA (polylactic acid), made from a polymer of natural origin, with characteristics similar to polystyrene for rigidity, transparency and brilliance, but with the advantage of its total compostability. With it all the accessories of the hanger were designed.

4. Results

The use of the "A/D Table" for the analysis of the most critical activities, has thus enabled the definition of extremely specific project requirements related to the limit users, in full accordance with the Design for All Approach, based on the enhancement of diversity, inclusion and equality.

In particular, the design process has enabled the development of innovative concepts of a clothes hanger, a dress label and a stand for clothes hangers.

The three elements of the system have also been verified in terms of anthropometric evaluation, compared to 1 and 99 percentiles of man and woman, even in wheelchair.

4.1. The clothes hanger

It is the central element of the system. Its shape is mainly characterized by the element hook/handle that contains two elements: the handle, whose shape has been designed for easy grip when the dress is still hanging and which at the same time accommodates a stopper on the end with the information on the dress size (which then can be read directly when the dress is still hanging crosswise to the user); a magnetic disk, to which you can temporarily fix the dress label (therefore equipped also of a small metallic element) for easier reading when the dress is still hanging on the clothes hanger.

This basic element is integrated with a whole system of elements, from the “shoulder hanger”, which in turn can accommodate different “shoulder accessories” (for the different sizes and models of clothes), and a roller for trousers.

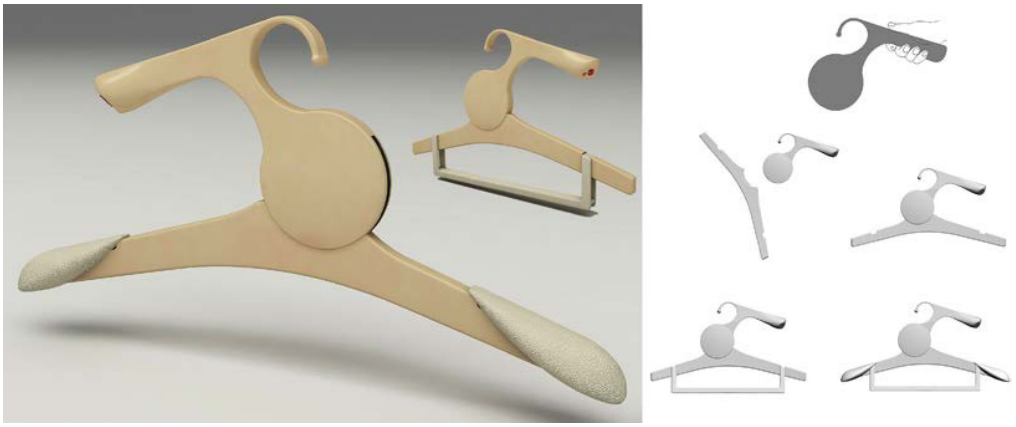

Fig. 3. The clothes hanger

4.2. The stand for clothes hangers

A personal stand for clothes hangers facilitates the purchase experience to everyone, when you need to bring to the fitting rooms and then to cash counter a number of clothes greater than one. In fact, two tubes, placed at different heights, let you easily bring to the fitting room up to 6 clothes. Four pivoting wheels enable its movement in any direction. Equipped with a handle, it can still be easily moved by a user in a wheelchair without the use of the hands.

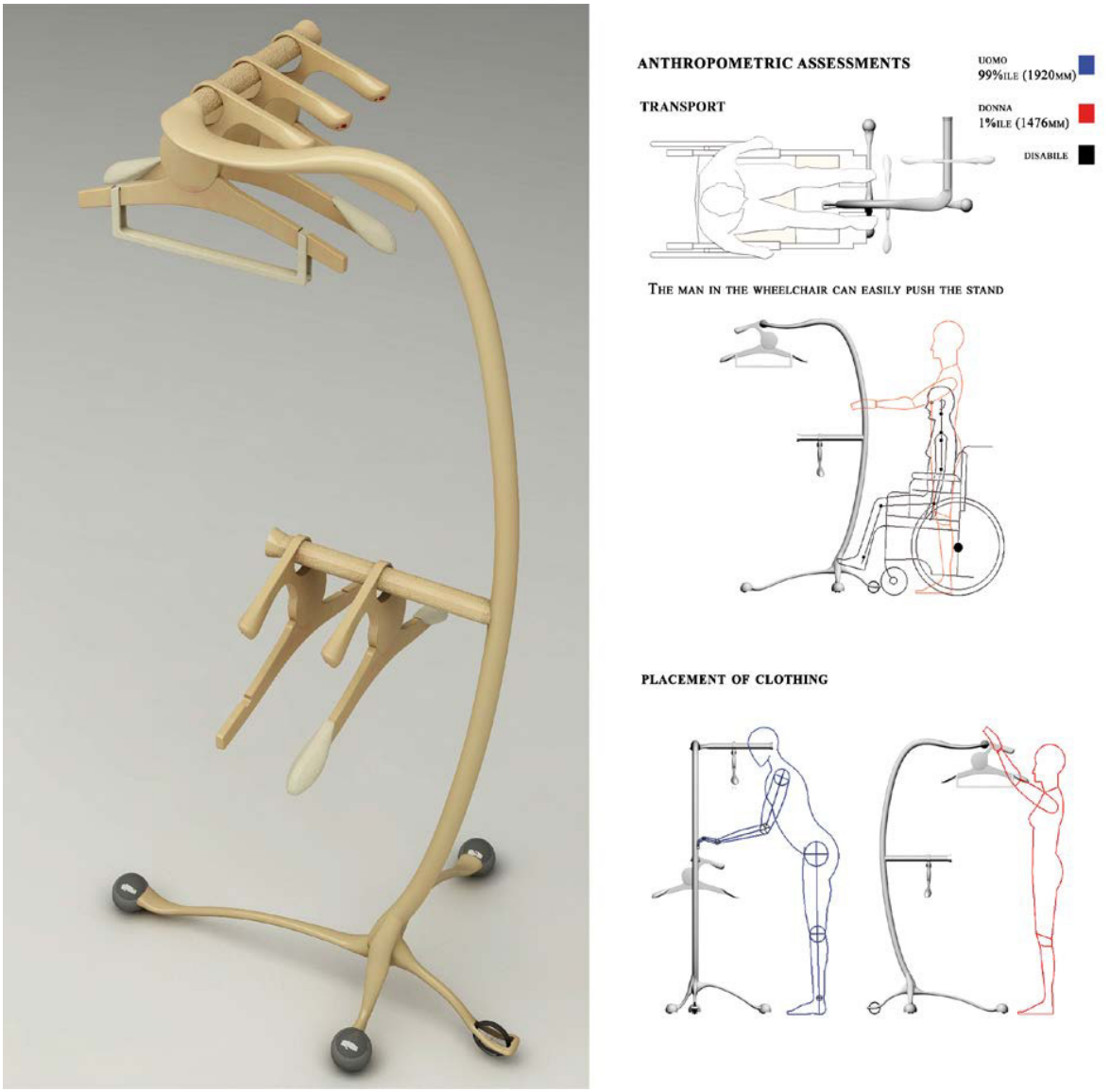

Fig. 4. The stand for clothes hangers and its anthropometric assessments

4.3. The dress label

In addition to the typical written information (also in Braille) relating to the item of clothing (size, type of dress, colors and patterns, fabric and price), the dress label includes also a QR Code, on which some guidelines were

developed, articulated with respect to the basic information (the same reported in writing), to the possible combinations of colors and patterns with other clothes in the store, to fabrics (including the cleaning and ironing mode suggested), to any short audio/video clip contributions. With a smartphone enabled to QR Code reading it is therefore possible to take advantage of all numerous additional information on the clothes that you are purchasing, to increase the awareness of the purchase experience.

Fig. 5. The clothes hangers with the magnetic dress labels

5. Conclusions

The possibility to carry out autonomously and comfortably all daily activities, including those related to recreation and free time such as shopping, is a critical precondition for pursuing inclusion. However, if designed with an approach DfA, information and exhibition systems used in clothing stores can improve and simplify the shopping experience for everyone, not just for the disabled.

In this, the A/D Table has confirmed to be a flexible tool of knowledge: it is an operational tool useful for the description of the framework of limit users needs in a Design for All approach. Sufficiently detailed and objective, its potential lie on the one hand in its relative ease of use, and on the other in the accuracy of the results it achieves, facilitating the construction of a framework of “inclusive" needs.

6. Credits

The present work reports some experiences carried out as part of a Master Degree Thesis developed in the Degree Laboratory "Interior design of sustainable living", academic year 2010/2011, at the Department of Architecture of the University "G. d'Annunzio "University of Chieti-Pescara. The Thesis is entitled" "Con-tact. Information/exhibition system for the independent choice of the item of clothing "(supervisor prof. S. Camplone, co-supervisor prof. G. Di Bucchianico, graduating Veronica Scarpa).

In particular, this contribution was written by Giuseppe Di Bucchianico (Abstract and Introduction) and Stefania Camplone (Objectives, Methods, Results and Conclusions).

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